

Euphorbia leistneri (Euphorbiaceae), a new species from the Kaokoveld (Namibia)

R.H. Archer

National Botanical Institute, Private Bag X101, Pretoria, 0001 Republic of South Africa
e-mail: rha@nbipre.nbi.ac.za

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Euphorbia leistneri R.H. Archer, a new species from the northern Kaokoveld, Namibia, is described. *E. leistneri* is a succulent shrub, superficially similar to *E. monteiri* Hook.f., showing a close affinity with *E. transvaalensis* Schltr., but it differs from that species in its thick succulent branches and segments, prominent tubercles and leaves terminal. *E. leistneri* is a rare species, at present recorded only from near the Epupa Falls in the Cunene River, which is threatened by a proposed hydroelectric scheme.

Keywords: *Euphorbia*, Euphorbiaceae, Leistner, new species, taxonomy, *Trichadenia*.

Introduction

A shrubby *Euphorbia* in the collection of the Pretoria National Botanical Garden has been recognized as new to science. This species was first collected in 1976 by Dr. O.A. Leistner *et al.* near the Epupa Falls in northern Kaokoveld, Namibia, and has been mistaken in the Pretoria National Botanical Garden for *Euphorbia monteiri*, to which it looks superficially similar. The proposed name commemorates Dr. Leistner, who retired in 1996 as Editor and Head of the Publications section of the National Botanical Institute.

Leistner has published extensively, particularly on arid-land ecology. His D.Sc. thesis, titled *The plant ecology of the southern Kalahari* (Leistner 1967), is still essential reading on the topic. Jointly with D. Edwards, Leistner developed a degree reference system for citing biological records in southern Africa (Edwards & Leistner 1971). With the *Southern African place names*, produced jointly with J.W. Morris (Leistner & Morris 1976), he supplied the geographical base for the development of PRECIS (National Herbarium [PRE] Computerized Information System) and citations of specimens in the present and many other botanical journals.

As editor of *Bothalia*, *Flowering Plants of Africa*, *Flora of southern Africa* and *Memoirs of the Botanical Survey of South Africa* and its successor, *Strelitzia*, he has made an immeasurable contribution to southern African botany. With his command of five languages and his wide knowledge of various fields of botany, particularly desert ecology and nomenclature, after his retirement, he still provides guidance and help to colleagues and staff at the National Herbarium in Pretoria.

Euphorbia leistneri is rare, known only from the type locality (Figure 1), and presumably confused with *E. monteiri*. It is curious that such a prominent plant has escaped attention until now.

Euphorbia leistneri R.H. Archer, *sp. nov.* ad subgenus *Trichadeniam* (Pax) Carter sectionam *Trichadeniam pertinens*; *E. transvaalensis* affinis sed ramis succulentibus segmentatis, segmentis prominente tuberculatis, segmento unico in quoque anno producto, solum segmento ultimo foliato, differt.

Typus.—Namibia: Kaokoveld, E of Epupa Falls, Leistner, Oliver, Vorster & Steenkamp 264; specimen prepared 31 January 1997 in the Pretoria National Botanical Garden (PRE, holo.; B, K, WIND).

Erect glabrous, succulent shrub, 1 m tall, sparsely to abundantly branched; main stem \pm 70 mm diam. with prominent tubercles. Branches succulent, \pm 20 mm thick, with prominent tubercles, \pm 5 mm exserted, pale green with fine reddish stripes, pigmentation conspicuous around leaf bases; leaf scars \pm 3 mm wide, obovate;

branches segmented, 10–20 tubercles per segment; leaves on terminal segments only, remaining segments leafless. Leaves arranged spirally clockwise, 10–20, petiolate, green, obovate, 25–30 \times 70–90 mm, base attenuate, apex rounded and minutely apiculate, margin entire, midrib prominent beneath, glabrous; petiole to 10 mm long; stipules reddish, glandular, knob-like. Cymes usually 4 at apex of branchlet, central cyme enlarged, 3 lateral ones \pm $\frac{1}{3}$ of length of central cyme; central cyme with 3-branched umbel forking twice, primary peduncle (ray) 50–120 mm long, bracts petiolate, \pm similar to leaves but shorter; lateral cymes with 2 cyathia, peduncles 10–60 mm long, bracts smaller than in central cyme. Cyathia on peduncle 6–25 mm, \pm 5 mm diam., with cup-shaped involucre; glands 5, but with gland under exserted female flower rudimentary, light green, transversely rectangular, 1.5 \times 1.7 mm, outer margin shallowly 2-lobed, surface rugulose; involucre lobes deltoid, 0.6 \times 1 mm, margin lacinate, apex shortly 2-lobed. Male flowers \pm 10; bracteoles terete to flattened, divided repeatedly into feathery filaments; stamens 4 mm long. Female flower: styles 2.5 mm long, joined for $\frac{1}{3}$ with spreading apices, bifid for $\frac{2}{3}$. Capsule erect, exserted on pedicel to 3 mm long, deeply 3-lobed, 8 \times 10 mm. Seeds light grey with prominent black spots, ovoid with acute apex, 6.5 \times 4.5 mm, tubercles prominently large, flattened. Flowering December and January. Ripe fruit collected April, after four months (Figures 2 and 3).

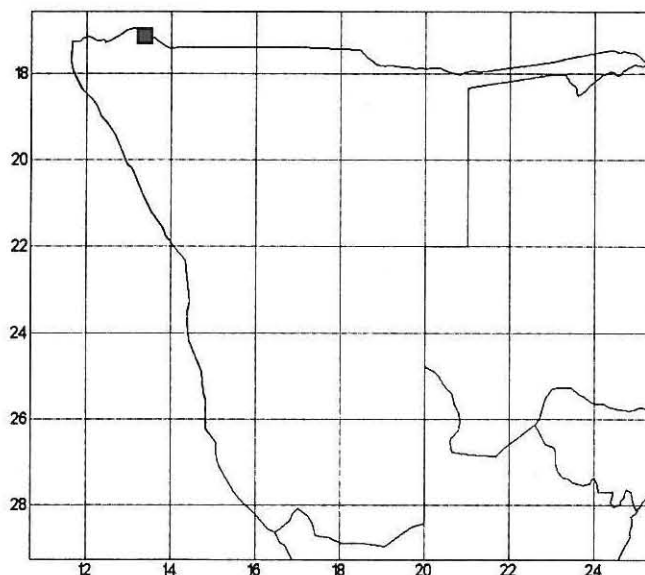


Figure 1 Known distribution of *Euphorbia leistneri*.

Distribution, habitat and conservation status

The Kaokoveld is a remote, mountainous region at the northern end of the Karoo-Namib Regional Centre of Endemism with at least 116 endemic or near endemic species (Hilton-Taylor 1994). The new species is an interesting addition which is critically rare since it is currently known from only one locality near Epupa Falls (Figure 1). During a short search in June 1997, no plants could be found outside a small area of 200 square metres. Local people questioned were unable to point out other localities. A critical search along both sides of the Cunene is essential.

The rainfall in the Kaokoveld is variable and unreliable, with an average of 400 mm per year at Epupa (Wardell-Johnson *et al.* 1997). Geology of the area consists of massive foliate to banded greenish granodiorite gneiss of the Cunene complex (Wardell-Johnson *et al.* 1997; Smalley *et al.* 1997). The soil is shallow, and consists of very coarse to fine rock particles with little clay or organic material. The soil where the plants were found is distinctively white with very high P, K and Ca values (but low in Mg) contrasting with surrounding reddish soils (Wardell-Johnson *et*

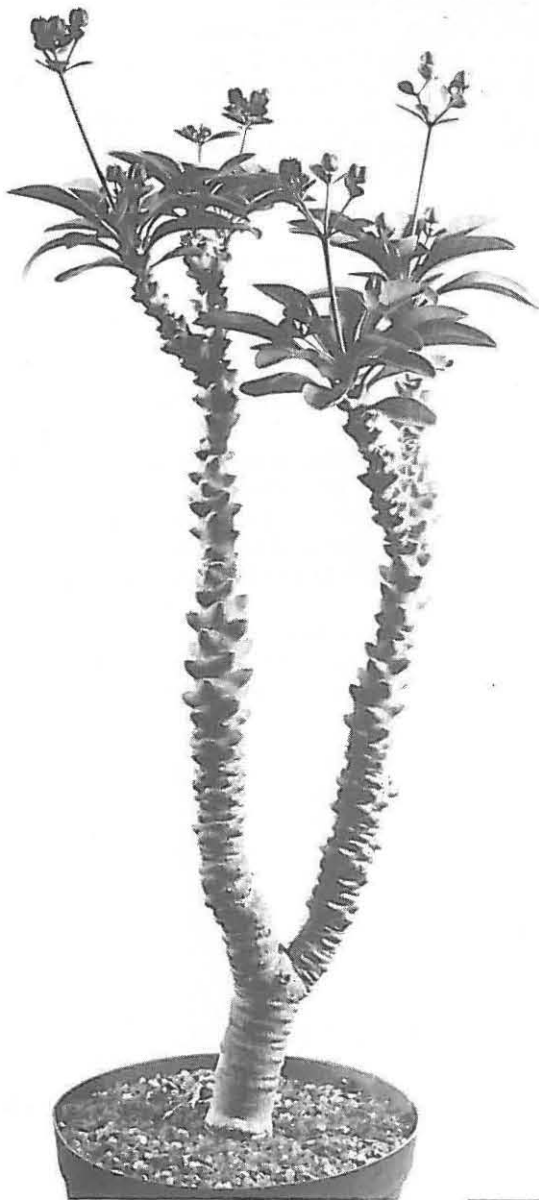


Figure 2 Original plant of *Euphorbia leistneri*, photographed February 1982 by A. Romanowski. Segmentation of branches not obvious. Scale bar = 50 mm.



Figure 3 Closeup of a branch and fruiting inflorescence. Scale bar = 10 mm.

al. 1997).

Epupa Falls is one of two sites under consideration for the controversial Epupa Hydroelectricity Scheme proposed for the Cunene River (Burmeister & Partners 1997). If built, the project which would be the highest hydroelectric dam in Africa, will flood an estimated 382 km², posing a definite threat to the only known population of *Euphorbia leistneri*.

Discussion

The new species clearly belongs to *Euphorbia* subg. *Trichadenia* (Pax) Carter. It shares the following characters which define the subgenus: knob-like glandular stipules, often found in young growth only, large crenulate glands, conspicuous terminal, dichotomously branching 3-many-rayed inflorescences with leafy bracts, and relatively large capsules with ovoid seeds (Carter 1988). Species included in this group are trees or shrubs, mostly with woody or semi-succulent branches, or herbs with a large fleshy rootstock.

Euphorbia leistneri is superficially similar to *E. monteiri* in its thick succulent branches with prominent tubercles, while most species of subg. *Trichadenia* have smooth woody stems. The involucre glands of the new species are green and pitted, in contrast with the red/purple glands with conspicuous processes of *E. monteiri*. It is close in inflorescence and leaf structure to *E. transvaalensis*, which undoubtedly makes this the nearest relative, but the new species differs distinctly from *E. transvaalensis* in the absence of a fleshy perennial rootstock; its thick succulent branches up to 70 mm in diam.; thick succulent segments formed by annual growth; the prominent tubercles and leaves on terminal segments.

Stems of *E. transvaalensis* are narrow and herbaceous when young with a soft pith. Old branches become woody, retaining

the central soft pith which shrivels upon drying, leaving the centre of the branch hollow. It can at most be described as semi-succulent. As new branches are usually resprouting, little secondary growth is observed, except for some plants collected in the Waterberg, Grootfontein and Otavi districts in Namibia, which occasionally had a thickened, more succulent base or roots wedged in rock cracks, having little room for the usually tuberous roots to expand. These plants correspond with a closely related, more northerly species, *E. goetzei* Pax, with the apices of branches clavate, particularly from drier areas in Kenya (Carter 1988).

Leaves of *E. transvaalensis* are usually spiral along the length of the branch, never exclusively terminal as in the new species. The leaves are variously shaped, oblong, elliptic or elliptic-ovate, but rarely obovate (in southern Africa) while leaves of *E. leistneri* are distinctively obovate. *E. transvaalensis* is a somewhat variable species, widely distributed in south tropical Africa from Angola to Mozambique. However, no intermediate specimens between this and the new species have been observed.

The variable gland shape in *E. transvaalensis*, even on the same plant, does not allow direct comparison with the new species. However, glands on the new species tend to be shallowly 2-lobed, while those of *E. transvaalensis* are more irregular with two or more teeth.

Although placed in unrelated parts of their key to species, White, Dyer & Sloane (1941) compare the inflorescence of *E. transvaalensis* with a 'flowering branch' reminiscent of the inflorescence structure in *E. monteiri*. The section *Pseudeuphorbium* Pax was erected to accommodate the single species, *E. monteiri*. *E. leistneri*, with the Zimbabwean *E. wildii* L.C. Leach would seem to belong in this section on account of the succulent stems. However, since *E. leistneri* is more closely related to *E. transvaalensis*, it should be better accommodated in sect. *Trichadenia* Pax. Carter (1985) formally raised *Trichadenia* to subgeneric status with two sections, *Trichadenia* and *Somalica*. The latter was soon moved to subg. *Lyciopsis* (Carter 1988). The resultant and more natural group consists of 19 species, of which 12 occur in East Africa (Carter 1985, 1988). There are seven southern African species including the type species, *E. trichadenia*, as well as *E. transvaalensis*, *E. pseudotuberosa* Pax, *E. multifida* N.E. Br., *E. gueinzii* Boiss., *E. monteiri* and *E. wildii* L.C. Leach. The distribution of subg. *Trichadenia* conforms to the disjunct distribution between southern Africa (particularly southwestern Africa) and East Tropical Africa displayed by many groups of plants (Jürgens 1997). Leach (1976) considered

this group closely related to, and which possibly gave origin to, the closely related sister genus, *Monadenium*.

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